ERGONOMICS, 2017
VOL. 60, NO. 9, 1177–1196
https://doi.org/10.1080/00140139.2017.1303085

Taylor & Francis
Taylor & Francis Group

Job design, employment practices and well-being: a systematic review of intervention studies

Kevin Daniels, Cigdem Gedikli, David Watson, Antonina Semkina and Oluwafunmilayo Vaughn

Employment Systems and Institutions Group, Norwich Business School, University of East Anglia, Norwich, UK

ABSTRACT

There is inconsistent evidence that deliberate attempts to improve job design realise improvements in well-being. We investigated the role of other employment practices, either as instruments for job redesign or as instruments that augment job redesign. Our primary outcome was well-being. Where studies also assessed performance, we considered performance as an outcome. We reviewed 33 intervention studies. We found that well-being and performance may be improved by: training workers to improve their own jobs; training coupled with job redesign; and system wide approaches that simultaneously enhance job design and a range of other employment practices. We found insufficient evidence to make any firm conclusions concerning the effects of training managers in job redesign and that participatory approaches to improving job design have mixed effects. Successful implementation of interventions was associated with worker involvement and engagement with interventions, managerial commitment to interventions and integration of interventions with other organisational systems.

Practitioner Summary: Improvements in well-being and performance may be associated with system-wide approaches that simultaneously enhance job design, introduce a range of other employment practices and focus on worker welfare. Training may have a role in initiating job redesign or augmenting the effects of job design on well-being.

ARTICLE HISTORY
Received 22 September 2016
Accepted 28 February 2017

KEYWORDS
Well-being; job design; employment practices; interventions

Introduction

There is long-standing and continuing interest in psychological well-being and the quality of jobs in work organisations (Grote and Guest 2017; Jones, Haslam, and Haslam 2017). The provision of high quality jobs is seen as a key lever in improving well-being in political circles (All Parliamentary Work Group on Wellbeing Economics 2014) and across a broad range of stakeholders including the general public, trades union officials, employment specialists, managers and students (Daniels et al. 2016). Moreover, the design of high quality jobs is relevant to a broad range of occupations (Grote and Guest 2017), and so with modifications to specific contexts where appropriate (e.g. Jones, Haslam, and Haslam 2017), job redesign has the potential to enhance well-being across the working population through improvements to the quality of jobs (Cousins et al. 2004).

Waterman (1993) considers that psychological well-being has two major components: subjective well-being and eudaimonic well-being. Subjective well-being comprises subjective assessments of life satisfaction, positive affect (e.g. joy, enthusiasm) and the relative absence of negative affect (e.g. lack of anxiety, feeling calm) (Diener 1984). One of the most popular taxonomies of eudaimonic well-being (Ryff and Keyes 1995) includes feelings of autonomy, mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Indicators of subjective well-being are often given greater weight as indicators of overall psychological well-being than indicators of eudaimonic well-being (Diener and Larsen 1993; O'Donnell et al. 2014; Warr 1994). Other authors consider that psychological well-being also includes markers of physical/psychosomatic health (Von Horn et al. 2004). There is also evidence of an association between indicators of the well-being of workers in an organisation and that organisation's performance (e.g. Whitman, Van Rooy, and Viswesvaran 2010) and evidence that well designed jobs are associated with work performance (Humphrey, Nahrgang, and Morgeson 2007; Wood et al. 2012).

Because of equivocal evidence on the well-being benefits of interventions solely focused on job redesign (e.g.

CONTACT Kevin Daniels kevin.daniels@uea.ac.uk
The supplemental data for this article can be accessed at http://dx.doi.org/10.1080/00140139.2017.1303085.

Bhui et al. 2012), our review focuses on other factors that could influence the success of job redesign interventions. The main purpose of the present systematic review is to examine the role of other employment practices in interventions targeted at improving well-being through improving job quality. Specifically, we examine whether other employment practices act as initiators of job redesign or as augmenters of job redesign. In the former process, job redesign may mediate the impact of other employment practices on well-being. In the later process, other employment practices may increase the impact of job redesign on well-being, either through a moderation process or through an additive process. Given links between job design, well-being and performance (Humphrey, Nahrgang, and Morgeson 2007; Whitman, Van Rooy, and Viswesvaran 2010) and establishing the cost effectiveness of job redesign necessitates examining factors that may offset the costs of job redesign, we also examine relationships with performance where studies concerned with well-being also report on performance outcomes.

There is no existing systematic review of intervention studies that capture the combined effects of job redesign and other employment practices on well-being, so the present study provides a unique contribution to the literature on job design and well-being. Moreover, by focusing on intervention studies, the present systematic review is also able to indicate evidence-based ways in which to introduce complex job redesign interventions into work organisations. To do so and in-line with recommendations for reviewing intervention studies (Snape et al. 2016), we examine process factors that may have affected how interventions were implemented.

Job design and well-being

Job design is concerned with the activities of workers, their duties, the tasks required to perform their work, and how those tasks and duties are structured and scheduled (Morgeson and Humphrey 2008; Parker and Ohly 2008). Modern typologies of job design include factors such as: job demands, job control, skill use, task variety, role clarity, use of skills, variety in tasks, support and social contact at work, and even employment security (see e.g. Cousins et al. 2004; Hackman and Oldham 1976; Karasek and Theorell 1990; Warr 2007). The different aspects of high quality or poor quality job design are subsumed under the general term 'job characteristics'.

Although different job characteristics may be more or less important for well-being depending on context and individual circumstances (Jones, Haslam, and Haslam 2017), there is consistent evidence from observational studies (i.e. non-intervention studies that assess naturally occurring levels of job characteristics) to indicate that job characteristics are reliable and prospective predictors of changes in well-being and psychological health (for systematic reviews, see Nieuwenhuijsen, Bruinvels, and Frings-Dresen 2010; Theorell et al. 2015; for a meta-analysis, see Stansfeld and Candy 2006). Job characteristics are reliable and prospective predictors of well-being and health even after adjusting for personality predispositions to poor well-being and psychological ill-health (see e.g. the meta-analysis reported by Ferguson, Daniels, and Jones 2006).

Job redesign is the means through which job characteristics can be changed to improve job quality. Job redesign can have 'top-down' elements (i.e. led by managers) or 'bottom-up' elements (i.e. initiated by workers) (Grant and Parker 2009). Systematic reviews and meta-analysis present mixed findings of interventions to improve job quality through job redesign: Two meta-analyses have reported no effects for such interventions (Richardson and Rothstein 2008; Van der Klink et al. 2001); a review of meta-analyses and systematic reviews reported mixed effects (Bhui et al. 2012); one systematic review reported a range of effects, some beneficial, some null and some adverse (Bambra et al. 2007). In a systematic review, Ruotsalainen et al. (2008) reported benefits in some studies and no adverse effects. A systematic review focused on changing shifting working patterns did reveal some shift patterns to have beneficial effects (Bambra et al. 2008).

Given that observational studies cannot rule out the possibility that the pattern of any observed results is caused by the action of some unmeasured variable (omitted variable bias), it may be the case that something naturally co-occurs with well-designed jobs in many organisational environments, yet this unknown phenomenon (or phenomena) is not purposefully introduced into many job design interventions. However, a meta-analysis (Neuman, Edwards, and Raju 1989) and two systematic reviews (Corbière et al. 2009; Naghieh et al. 2015) provide some indication that interventions that seek to improve job design and simultaneously introduce other employment practices (e.g. skills training) may have more reliable effects on improving well-being than interventions focused solely on enhancing job design.

Given that previous reviews and systematic reviews have established that organisational interventions to improve job design do not have reliable beneficial effects on worker well-being, in the present systematic review, we focus on a distinctive new line of enquiry on the role of other employment practices (e.g. performance management processes, pay schemes and training) in the process of job redesign.

There are two major theoretical perspectives that suggest a role for other employment practices in the redesign of jobs. First, socio-technical systems theory indicates that changes in one organisational sub-system or processes

need to be compatible with other organisational processes and sub-systems (Cherns 1987; Clegg 2000; Davis et al. 2013). This suggests that unless established organisational practices and processes are compatible with redesigned jobs, job redesign needs to be made in tandem with changes in other practices and processes to ensure compatibility. Moreover, the principle of joint optimisation in socio-technical systems thinking (Cherns 1987) indicates that changing job design to improve well-being should also be cognisant of impacts on performance. On the other hand, job redesign focused purely on performance (or some organisational goal) rather than enhanced worker well-being could produce adverse effects on worker well-being if the intention is to optimise performance without considering other outcomes. Indeed, a narrow focus on performance without considering adverse impacts on well-being may be counter-productive (cf. Whitman, Van Rooy, and Viswesvaran 2010). The principle of joint optimisation therefore indicates the focus of job redesign might be important (e.g. on well-being or performance) and that links between job redesign, well-being and performance are important to explore. Socio-technical systems theory also indicates that job redesign should include input from those closely affected by changes to jobs (Cherns 1987): In the case of job redesign, this could refer to workers or their line managers being involved in the redesign of jobs, as the work of both can be affected by job redesign (e.g. granting workers' more autonomy can redistribute power from line managers to workers). Therefore, job redesign interventions might be more successful if employment practices involve workers and/or line managers in the redesign of their jobs.

Second, the high performance work systems literature (Appelbaum et al. 2000; Combs et al. 2006) indicates that different human resource management practices operate in synergistic bundles to influence organisational performance. Such practices include high quality job design, rigorous recruitment and selection processes, extensive training, performance management systems, contingent pay and secure employment (Combs et al. 2006). These practices work to enhance workers' abilities (e.g. through selection or training), motivation to use those abilities (e.g. through high-quality job design or contingent pay) and opportunity to use those abilities (e.g. through high-quality job design with devolved autonomy, skill use and task variety). Although there is evidence that high performance work systems are associated with better organisational performance (Combs et al. 2006), links between high performance work systems and worker well-being are less clear (Van De Voorde, Paauwe, and Van Veldhoven 2012). However, a recent study indicates extensive use of high performance work systems, including high quality job design, is related to enhanced worker well-being, but that the moderate use of the underpinning employment practices may be related to low levels of well-being (Ogbonnaya et al. 2017). Moreover, there is evidence that high performance work systems can be focused on specific organisational outcomes (Martinaityte, Sacramento, and Aryee in press), and it may be the case that high performance work systems have no beneficial or even adverse impacts on well-being if the system does not have worker well-being as one of its foci (Van De Voorde, Paauwe, and Van Veldhoven 2012).

In summary, both the socio-technical systems theory and the high performance work systems literatures indicate that job redesign needs to be integrated with other employment practices to enhance well-being and performance (Combs et al. 2006; Davis et al. 2013; Ogbonnaya et al. 2017). This would suggest that other employment practices may augment job redesign, so that job redesign and some other employment practice(s) needs to be present in order to influence well-being and/or performance. In statistical terms, this could: (a) imply that other employment practices moderate the impact of job redesign on well-being and performance, but: (b) could also represent independent effects in which job redesign and other employment practices combine additively to improve well-being beyond a certain, noticeable threshold (e.g. statistical significance). However, as indicated by socio-technical systems theory and the principle of involving stakeholders in job redesign (Cherns 1987), it is also possible that job redesign might be influenced by employment practices that encourage workers or line managers to become involved in the redesign of jobs. In statistical terms, this would imply job redesign mediates the effects of other employment practices on well-being or performance. Both socio-technical systems theory and the high performance work practices literature also suggest that interventions are more likely to influence well-being if interventions are introduced with some concern for worker well-being rather than being focused purely on other organisational goals (Van De Voorde, Paauwe, and Van Veldhoven 2012).

We have three distinct research questions concerned with the content of interventions. The first question reflects the potential role of other employment practices as an antecedent of job redesign or as an augmenter of job redesign. The second question reflects the potential for the focus of the intervention to influence well-being outcomes. The third question reflects the potential for the interventions studied in this review to also influence performance. In this review, recognising that different studies could use different performance metrics, we take a broad approach to performance, encompassing performance at multiple levels (e.g. individual, organisational) of analysis and assessed by diverse indicators (e.g. supervisor-rated

performance, objective indicators of time delays in production).

(RQ1) What role do employment practices play (e.g. training, high investment selection) in the relationship between job redesign and well-being? Do employment practices have a role as interventions to (a) improve job design and hence well-being or (b) as augmenters of interventions to improve job design and hence well-being?

(RQ2) Does the focus of job redesign matter for improving well-being, for example whether job redesign is targeted at productivity (e.g. through introducing new technologies, for efficiency) or targeted at well-being?

(RQ3) Do the interventions investigated under RQ1 also influence performance?

Because this review is targeted at complex interventions, it is important to consider factors that could influence how interventions were implemented (e.g. behaviour of line managers, workers' motivation to engage with the intervention). Not only do such factors aid understanding of how to successfully implement complex interventions (Snape et al. 2016), considering such factors can also help diagnose why some interventions did not have intended effects (Biron, Karanika-Murray, and Cooper 2012). As well as providing means of differentiating successful from unsuccessful interventions, addressing issues concerned with implementation could help develop better theories of job (re)design that incorporate information on what an intervention should contain and how that intervention can be implemented. Therefore, we have a fourth research question:

(RQ4) What factors influence the successful implementation of interventions investigated under RQ1?

Method

Prior to the review, the research team developed a protocol outlining the process for the review and the criteria for including or excluding studies from the review. The protocol was designed according to best practice PRISMA-P reporting guidelines (Shamseer et al. 2015) and registered on PROSPERO, The International prospective Register for Systematic Reviews.

Criteria for including or excluding studies for the review

To operationalise the research questions as inclusion/exclusion criteria, we were guided by the PICOS approach (population, intervention, comparators, outcomes and study design, Liberati et al. 2009; Shamseer et al. 2015). The review team sought input from experienced researchers working in the fields of well-being and job design.

Population

We considered any studies that focussed on well-being in the working population in advanced industrial democracies (e.g. EU-15 countries, USA, Australia, Japan). Studies in countries where economic conditions (and therefore work conditions and organisational context) differ markedly from advanced industrial democracies were excluded. The decision to focus on advanced industrial democracies was based on significant institutional factors that may influence labour markets and the quality of jobs, including but not limited to: greater levels of employment protection through legislation; employees' expectations of their work environment; expectations regarding corporate social responsibility; health and safety legislation; wide-spread availability of vocational education and skills training; widespread and professionalised expertise in occupational health, ergonomics, work psychology, human resource management and other related disciplines in universities and consultancies. Although recognising this bounds the scope of the present review, it does allow synthesis and practical application of evidence from more homogenous institutional contexts than would be the case if research from other contexts had been included in the review.

Intervention

The review sought to identify studies that examined aspects of job design in combination with other employment practices (e.g. training). A study could be included if: it examined a job redesign intervention and assessed other employment practices; if it examined changes in other employment practices and assessed job design; if it examined simultaneous changes in job design and other employment practices. We included studies which measured performance outcomes but only if they also assessed changes in well-being.

Comparators

We were interested in a range of factors which might influence well-being at work but did not intend to make comparisons between specific features of jobs for example impact of job autonomy versus skill use. Ideally, we wanted to be able to compare groups who had been subject to a change or intervention in the workplace with a control group who had not. Such intervention groups could include groups subject to changes in employment practices and job redesign, groups subject to changes in employment practices only and groups subject to no change. We also included studies where the only comparator was levels of well-being before the intervention.

Outcomes

Studies were included if they measured a change in well-being. Subjective measures of well-being (e.g. self-report surveys) and/or objective measures (e.g. days of sick leave taken) were included. If studies also included measures of performance, data on performance were extracted. We extracted data on all performance metrics reported at individual, group or organisational levels of analysis, including subjective and objective performance data.

Study designs

We included longitudinal studies of interventions (e.g. randomised control trials, quasi-experiments, before and after qualitative case studies of interventions) since these provided more robust evidence of causality and ecological validity than other designs (e.g. laboratory simulations, panel studies, *post hoc* only analysis of interventions).

Other

We included empirical research published in peer-reviewed journals. The rationale for this being that there was a sufficient wealth of data within peer-reviewed research to answer the research questions and that it offered greater assurance of quality and rigour. Although we did not exclude papers not in English, our searches were restricted to English language databases because the research team did not have the capacity to search beyond these. We restricted our searches to papers published between 2005 and 2016. This decision was based on the view that more recent research will use more rigorous methodologies and recent data, will incorporate important findings from previous research and will capture working in modern working environments in developed economies (e.g. exposure to global competition, use of advanced manufacturing and extensive use of information and communication technologies, including media rich and mobile technologies). Moreover, previous reviews have indicated published studies of multi-component interventions that include job redesign are rare: Corbière et al. (2009) identified only two studies (published in 2002 and 2004) and Naghieh et al. (2015) found just one study based on Chinese teachers. Therefore, the findings from previous reviews have been incorporated into the justification for this review, findings from previous reviews would not have been double counted in this review and previous reviews, and prior reviews indicated little was to be gained from extending the review period further back in time.

Searches

The search terms were developed on the basis of the research questions and the inclusion/exclusion criteria detailed above. The final search terms for each of the PICOS can be obtained from Kevin Daniels' Researchgate page or by email. The electronic searches were performed up to the 4 February 2016 on the following databases: EconLit, PsycINFO, PubMed Central (PMC), Web of Science, Scopus, Business Source Complete and Academic Search Complete.

Study selection

The studies were initially sifted according to the date published and publication type (Figure 1). This returned 1458 titles as 'hits'. Two review authors sifted the titles. Any disagreements were discussed and if a consensus could not be reached the study was put through to the next stage. Cohen's κ rating indicated a good the level of agreement between the two reviewers ($\kappa = 0.76$).

Following this initial sift the research team sifted the abstracts. This was preceded by a pilot sift of 50 abstracts (chosen at random) to help ensure consistency of interpretation. Each abstract was sifted independently. All disagreements were resolved by discussion between the two reviewers or referred to a third member of the team if it was not possible to reach agreement. Cohen's κ scores indicated moderate to good levels of agreement between reviewers, ranging between 0.54 and 0.70.

Next full papers were sifted. The papers were screened independently by two reviewers. Disagreements were resolved by discussion between the two reviewers or referred to the third member of the team. Cohens κ scores indicated good levels of agreement between reviewers, ranging from 0.69 to 0.87. Out of the original search results 37 papers made it through to the data extraction phase of the review. Following data extraction, four studies were removed from the review because they did not meet inclusion criteria.

Data extraction

Data extraction sheets were piloted by three members of the review team prior to data being extracted. The full review team met to go through the data extraction process and practice on papers together. The papers were then divided between each reviewer for coding. Consistency of coding was checked by assigning papers so that each reviewer had one paper double coded by another reviewer. After data extraction, the whole review team met once again to discuss the results and check consistency of data extraction. Although the review team felt that there was consistency in data extraction in relation to outcomes, the team was less certain about process and implementation factors. Therefore, all papers were second coded for process and implementation factors, and second coders' comments incorporated into first coders' comments.

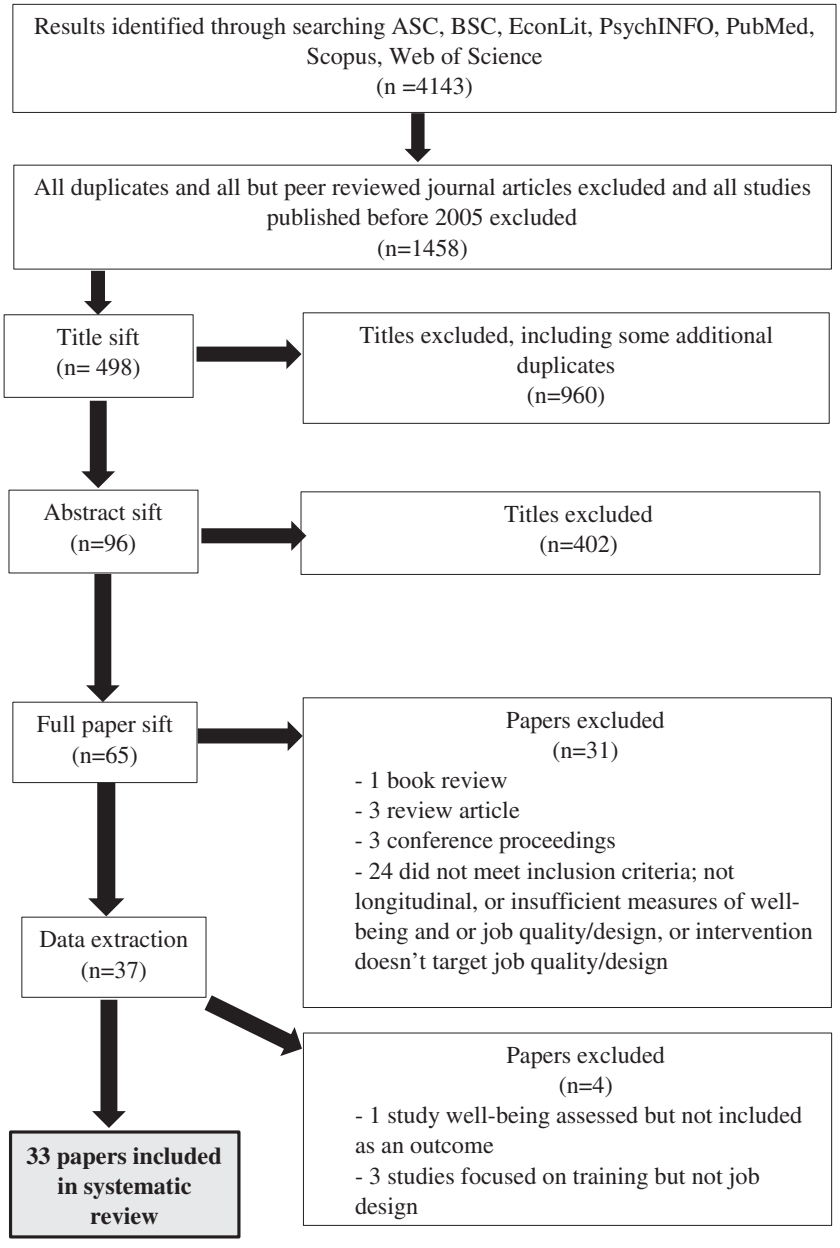

Figure 1. Stages of study selection.

Once data were extracted, the first author synthesised the data extraction sheets into an evidence summary table and categorised studies into type of intervention. Detailed descriptions of the interventions in the data extraction sheet enabled the first author to classify of the focus of the intervention as concerned with worker well-being or not. The first author then developed a series of harvest plots (adapted from Ogilvie et al. 2008 to be applicable to this review), evidence statements summarising the evidence, quality gradings for the evidence (see next section) and a narrative review of the evidence. Before commencing the narrative review, three authors met to review the evidence summary table, the Harvest plots and the evidence statements to discuss the evidence, how it should be interpreted and the accuracy of the evidence statements. On the basis of this discussion, some modifications were made to the evidence statements. (The evidence tables and Harvest plots can be obtained from Kevin Daniels' Researchgate page or by email).

Quality evaluation

The final quality grading for evidence was based on recommendations made for reviews of complex interventions targeted at well-being (Snape et al. 2016). Snape et al. provide four categories of evidence: 'Strong evidence', in which there is confidence that an intervention has an impact in stated group and context; 'Promising evidence'

which suggests an impact may occur but requires further investigation; 'Initial evidence' which requires further investigation and although an effect may occur, there is less confidence than for 'promising evidence'; 'Evidence not yet strong enough for conclusions' where there is insufficient evidence to make conclusions. For quantitative studies, the strength of evidence is based on: Limitations in the design and implementation of available studies; (i) indirectness of evidence; (ii) unexplained heterogeneity or inconsistency of results; (iii) imprecision of results; (iv) probability of publication bias (Higgins and Green 2008). For qualitative studies, evidence is graded according to: methodological limitations of the qualitative studies contributing to a review finding; relevance to the review question of the studies contributing to a review finding; coherence of the review finding; adequacy of data supporting a review finding (Lewin et al. 2015). Three of the review team discussed and agreed the evidence gradings.

Findings and discussion

Of the 33 studies reviewed, 31 were concerned with the outcomes (i.e. well-being, performance) of an intervention and two were concerned purely with how interventions were implemented. Of the 31 concerned with outcomes, 10 employed mixed methods approaches, with the remainder being purely quantitative. One implementation study employed a purely qualitative approach (Nielsen, Abildgaard and Daniels 2014, although the focus was on understanding how questionnaires can be used to develop interventions) and one employed mixed methods (Greasley and Edwards 2015). Of the 31 studies focused on outcomes, some 26 provided sufficient detail of the context to make a statement concerning potential factors influencing the process of intervention implementation, although the mixed methods studies tended to provide richer and more contextually grounded evidence concerning implementation processes. Only one study provided quantitative data on implementation processes.

The 31 studies focused on outcomes could be divided into five categories. These categories were not discrete; studies that could potentially cross categories are noted in the text below. The first three categories referred to employment practices that could enhance well-being through job redesign. The fourth and fifth categories referred to employment practice that could augment the effects of job redesign. The five categories were:

(1) Interventions focused on training people to develop better quality jobs themselves (Cohen and Gagin 2005; Coogle, Head, and Parham 2006; Ellis, Hutman, and Chapin 2015; Glisson et al. 2012; van den Heuvel, Demerouti, and Peeters 2015; Le Blanc et al. 2007; Shonin et al. 2014; Van Wingerden, Derks, and Bakker 2017; Yamagishi, Kobayashi, and Nakamura 2008). These interventions were considered to be related to changes in job design and other employment practices because training was used to improve job design.

(2) Interventions focused on training leaders to improve job design for those they manage (Biggs, Brough, and Barbour 2014; Elo et al. 2014; Odle-Dusseau et al. 2016). These interventions were considered to be related to changes in job design and other employment practices because training was used to improve job design.

(3) Interventions focused on using participative methods so that work groups developed better quality jobs (Bartunek et al. 2006; Dahl-Jorgensen and Saksvik 2005; Eklof and Hagberg 2006; Elo et al. 2008; Kobayashi et al. 2008; Linden et al. 2014; Mattila et al. 2006; Poulsen et al. 2007; Sørensen and Holman 2014). These interventions were considered to be related to changes in job design and other employment practices because participation is an employment practice focused on employee involvement and participation was used to improve job design. Two studies were conducted in the same organisation yet reported different interventions. For the purpose of this review (Elo et al. 2008; Mattila et al. 2006), these two studies were combined and considered together.

(4) Studies focused on combined effects of aspects of job design and training (d'Ettorre and Greco 2015; Jones et al. 2008; Robertson et al. 2008; Uchiyama et al. 2013; Umanodan et al. 2009, 2014). These interventions were considered to be related to changes in job design and other employment practices because they give an indication of whether introducing training alongside enhanced job design has more reliable effects on well-being.

(5) Interventions focused on system wide changes that included changes to job design alongside multiple and broad changes to other organisational processes (Elke and Zimolong 2005; Morris and Venkatesh 2010; Rickard et al. 2012; Tregaskis et al. 2013). These interventions were considered to be related to changes in job design and other employment practices because of the multimodal nature of the interventions.

Where the interventions were hypothesised to work through self-initiated changes in work environments

Table 1. Summary evidence statements with quality ratings.

Evidence statement (outcomes)	Quality rating	Reasoning
1. Training workers to improve their own job design may improve well-being and may, in some cases, also improve performance.	Promising	Although there were some randomised control trials, sample sizes tended to be small and some studies has short follow-up periods, contributing to study limitations. There were no consistent effects across all studies.
2. Although there may be an effect in some circumstances, there is insufficient evidence to make any recommendations concerning the effects of leadership training directed at job design on the well-being or performance of workers.	Initial	Only three studies, no randomised control trials and there were no consistent effects across all studies.
3. Participatory approaches to improving job design have mixed effects on well-being, job design and performance, including adverse outcomes in some circumstances.	Initial	Despite some randomised control trials and large sample sizes, there were inconsistent results including adverse effects. Process analysis cannot uncover with any degree of certainty that implementation issues were responsible for null or adverse effects. However, it is possible that implementation issues may be masking a true effect for some interventions.
4. Training coupled with direct improvements with job design may improve well-being, and may, in some cases, also improve performance.	Promising	There were only two randomised control trials and some studies combined observational evidence (e.g. on job design) with intervention evidence (e.g. training) rather than full multimodal interventions on job design and employment practices. There were no consistent effects across all studies.
5. System wide approaches, that simultaneously enhance job design and a range of other management practices and that are focused on worker welfare, may improve well-being and performance.	Promising	Although there were no randomised control trials, there were consistent effects in a clearly identifiable sub-set of studies (those focused on worker welfare) on performance indicators as well as well-being indicators. Two studies used performance data gathered from company records.
Evidence statements (process)		
(i) Contextually grounded and/or participative methods may provide a basis for interventions to improve job design.	Promising	Supported by one of the better quality process focused studies and triangulated across some of the mixed methods studies.
(ii) Managerial commitment is important but may be insufficient by itself	Promising	Supported by one of the better quality process focused studies and triangulated across some of the mixed methods studies. Consistent with theories of change.
(iii) It may be important to integrate well-being interventions with other systems	Promising	Supported by one of the better quality process focused studies and triangulated across some of the mixed methods studies. Consistent with socio-technical systems theory.
(iv) Worker engagement may be important including voluntary engagement in participative elements and it may be important for engagement to be widescale	Promising	This was rated moderate confidence, although not surfaced in the better quality process focused studies, the statement is consistent with major models of change and there is evidence from several mixed methods studies.

(worker training, leadership training, participative methods), we also examined whether the interventions improved the presumed mediator of effects on well-being, namely job design. Table 1 shows each of the evidence statements and the quality ratings as appropriate.

Studies of interventions where employment practices are used to enhance job design

The three categories of intervention reviewed in this section were concerned with using different employment practices to improve job quality through job redesign. Therefore, we examined whether there was evidence that job design, as well as well-being and performance improved for workers exposed to the interventions.

Interventions focused on training people to develop better quality jobs themselves

We examined nine studies, of which five were randomised control trials, two were non-equivalent control group designs and two were pre-post-test only with no control group design. Across the nine studies, some 428 workers were exposed to training interventions. Post-intervention assessments of change in focal variables varied from very short (0 months after the intervention) to 18 months post-intervention. Six of the nine studies conducted post-intervention assessments after three months or less.

Of the nine studies, six demonstrated at least one positive effect across the broad range of well-being indicators (i.e. subjective well-being, physical health, eudaimonic well-being) and subjective well-being specifically (Cohen and Gagin 2005; Coogle, Head, and Parham 2006; Ellis, Hutman, and Chapin 2015; Glisson et al. 2012; Le Blanc et al. 2007; Shonin et al. 2014). Of these six, five demonstrated impacts on well-being across 50% or more of the well-being indicators (broader range and subjective) assessed in the study (Cohen and Gagin 2005; Coogle, Head, and Parham 2006; Glisson et al. 2012; Le Blanc et al. 2007; Shonin et al. 2014). Of those studies demonstrating positive effects on well-being, four also assessed changes in job design. All four demonstrated some improvements in job design (Cohen and Gagin 2005; Coogle, Head, and Parham 2006; Glisson et al. 2012; Shonin et al. 2014), and two of these demonstrated effects across 50% or more of the job design indicators assessed (Coogle, Head, and Parham 2006; Shonin et al. 2014).

Three studies indicated no effects on well-being (van den Heuvel, Demerouti, and Peeters 2015; Van Wingerden, Derks, and Bakker 2017; Yamagishi, Kobayashi, and Nakamura 2008). Of the two studies that assessed job design, one indicated no effects on job design (Yamagishi, Kobayashi, and Nakamura 2008) and one indicated some qualitative evidence for improvements in job design (Van Wingerden, Derks, and Bakker 2017). All of the studies that demonstrated no effects on well-being had short-term post-intervention assessments (less than or equal to three months).

Of the two studies that examined effects on performance, both demonstrated some positive effects of the intervention (Shonin et al. 2014; Van Wingerden, Derks, and Bakker 2017). One demonstrated effects across the entire sample (Shonin et al. 2014). However, the other (Van Wingerden, Derks, and Bakker 2017) demonstrated effects only for those workers that had been trained in both developing personal resources (i.e. hope, optimism, self-efficacy, resilience) and how to improve their own job design. However, both studies are limited because they used self-reported performance rather than performance assessed objectively or by others.

Although the studies generally demonstrated positive effects for training to improve job design and no adverse effects, some mitigating factors need to be considered. One of the randomised control trials that demonstrated positive effects on job design and well-being (Shonin et al. 2014) was an intervention focused on meditation. This intervention cannot be considered a direct intervention to train workers to improve the quality of their own jobs: at best it can be considered an indirect intervention that (unintentionally) provided workers with some skills to develop their jobs. When this intervention is removed from the evidence along with the weaker pre-post-test studies with no control group, the number of stronger studies demonstrating some beneficial effects is the same as the number of studies showing no effects on well-being across the broad range of indicators. When removing the meditation study and the weaker study designs, two studies demonstrated improvements in job design compared to one study demonstrating no effects, and only one study (out of one) demonstrated effects on performance, although the effect on performance was conditional on other factors.

Because of these factors, and because the sample sizes tend to be small for studies examining training interventions and that the interventions did not show universally positive effects, we did not give the evidence a 'strong' grading. Moreover, conclusions regarding performance were made on the basis of studies that also assessed well-being. Nevertheless, on the basis that some interventions demonstrated beneficial effects and no adverse effects were uncovered, we rated the evidence as 'promising' for our first evidence statement:

> Evidence statement 1: Training workers to improve their own job design may improve well-being and may, in some cases, also improve performance.

There are qualifiers to this statement. First, the effects of training may take several months to accumulate, and evaluations with short-term follow-ups may miss the accumulation of benefits for job design, performance and well-being. Second, whether or not the intervention was focused on worker welfare did not appear to matter for training interventions. Four interventions were focused on some form of worker welfare: Two demonstrated no effects on well-being (van den Heuvel, Demerouti, and Peeters 2015; Van Wingerden, Derks, and Bakker 2017) and two demonstrated at least one positive effect on well-being (Le Blanc et al. 2007; Shonin et al. 2014). For those interventions not specifically targeted at worker welfare, four demonstrated at least one positive effect on worker well-being (Cohen and Gagin 2005; Coogle, Head, and Parham 2006; Ellis, Hutman, and Chapin 2015; Glisson et al. 2012) and one had no effect on well-being (Yamagishi, Kobayashi, and Nakamura 2008). Training to improve job design may be relatively cheap and relatively straightforward to implement compared to other interventions considered in this review. This latter point could be significant if cost-effectiveness is a consideration.

Of the studies focused on training, two had features in common with the fourth class of interventions considered, namely those focused on training and improving job design. One, a cluster randomised control trial (Le Blanc et al. 2007) demonstrated beneficial effects on well-being over a 12 month period: The intervention was a team based training intervention targeted at improving support in the workplace (an aspect of job design), reducing workplace stressors and enhancing problem-solving skills. The training also included components targeted at solutions that were compatible with wider organisational processes. The other (Van Wingerden, Derks, and Bakker 2017) had a non-equivalent control group design with a short-term follow-up post-intervention and small sample size. Although there were no effects on well-being, this study did indicate beneficial effects on (self-reported) performance of a multimodal training intervention targeted at improving personal resources (hope, optimism, self-efficacy, resilience) and improving job design.

Interventions focused on training leaders to improve job design for those they manage

For this category of interventions, we examined three studies (two non-equivalent control group designs and one pre-post-test only with no control group design). Some 338 workers were exposed to the interventions.

Post-intervention assessments of change in focal variables varied from five to 24 months post-intervention.

Two interventions had positive effects on well-being (subjective indicators and the broader class of indicators; Biggs, Brough, and Barbour 2014; Odle-Dusseau et al. 2016) and all three had some beneficial effects on job design. Of the two studies that examined performance, one indicated a positive effect (Odle-Dusseau et al. 2016) and one indicated no effect (Biggs, Brough, and Barbour 2014). There were no adverse effects on well-being, performance or job design. However, given the small number of studies, inconsistent findings with respect to well-being and performance across studies, that conclusions regarding performance were made on the basis of studies that also assessed well-being, and the absence of randomised control trials, we considered the evidence to be in the 'initial' category of the evidence ratings. In light of the small number of studies and inconsistent results in particular, our second evidence statement is:

> Evidence statement 2: Although there may be an effect in some circumstances, there is insufficient evidence to make any recommendations concerning the effects of leadership training directed at job design on the well-being or performance of workers.

This is not to say the leadership training cannot be used to improve worker well-being, rather that there is insufficient evidence that, in many contexts, training leaders improves worker well-being through improving the quality of workers' jobs. In two studies, the interventions were focused on worker welfare, with one intervention showing positive effects on well-being (Odle-Dusseau et al. 2016) and the other showing no effects (Elo et al. 2014). The other study had positive effects on well-being (Biggs, Brough, and Barbour 2014). The small number of studies means there is insufficient evidence to make claims regarding whether interventions need to be focused on worker welfare. However, analysis of implementation issues (see section below) does indicate management development may be required to foster commitment amongst managers to interventions to improve worker well-being.

Interventions focused on using participative methods to develop better quality jobs

Nine studies assessed participative interventions, although two studies (Elo et al. 2008; Mattila et al. 2006) were conducted in the same organisation and so were treated together as a single study for the purpose of evidence synthesis. Over 4300 workers were exposed to interventions in two randomised control trials, two non-equivalent control group studies, three pre-post-test only no control group studies and a mixed design involving a non-equivalent control group in one element and a pre-post-test only no control group design in another (two studies combined; Elo et al. 2008; Mattila et al. 2006). Post-intervention follow ups ranged from six to 24 months.

In relation to effects on the broader class of well-being indicators, five studies indicated positive effects (Bartunek et al. 2006; Kobayashi et al. 2008; Linden et al. 2014; Poulsen et al. 2007; Sørensen and Holman 2014), two studies indicated no effects (Eklof and Hagberg 2006; Elo et al. 2008/ Mattila et al. 2006) and one indicated an adverse effect (Dahl-Jorgensen and Saksvik 2005). Excluding weaker pre-post-test only no control group studies, and focusing on randomised control and non-equivalent control group designs, two studies indicated beneficial effects (Kobayashi et al. 2008; Linden et al. 2014), one study indicated a null effect (Eklof and Hagberg 2006) and one study indicated an adverse effect (Dahl-Jorgensen and Saksvik 2005). A similar pattern emerges for subjective well-being indicators: Across all studies, four studies indicate some beneficial effects (Bartunek et al. 2006; Kobayashi et al. 2008; Poulsen et al. 2007; Sørensen and Holman 2014) and three studies no effects (Dahl-Jorgensen and Saksvik 2005; Eklof and Hagberg 2006; Elo et al. 2008/ Mattila et al. 2006). Amongst the stronger studies, two indicated no effects (Dahl-Jorgensen and Saksvik 2005; Eklof and Hagberg 2006) and one study indicated conditional beneficial effects on subjective well-being indicators (Kobayashi et al. 2008). Moreover, one study that examined the combined effects of training and enhancing job design through participatory methods reviewed in the following section (Uchiyama et al. 2013) also found no effects of the intervention on well-being.

For job design, four studies using weaker designs indicated some improvements in job design (Bartunek et al. 2006; Elo et al. 2008/Mattila et al. 2006; Poulsen et al. 2007; Sørensen and Holman 2014) but studies using stronger designs indicated either null effects (Dahl-Jorgensen and Saksvik 2005; Eklof and Hagberg 2006), or some adverse effects on job design (Kobayashi et al. 2008). In relation to performance indicators, three studies indicated some beneficial effects (Bartunek et al. 2006; Linden et al. 2014; Poulsen et al. 2007) but one indicated no effect (Kobayashi et al. 2008) and one indicated an adverse effect (Elo et al., 2008/Mattila et al. 2006).

The results from studies of participatory interventions to improve job design present mixed results. In several cases, authors were able to provide some information on factors that may have affected the implementation of the participatory intervention. These are discussed in the section on implementation processes below.

Given the large sample sizes, longer term post-intervention assessments together with two randomised control and two non-equivalent control group designs, the results may be categorised as 'promising' on the evidence classification of the quality of the evidence. However, inconsistent

effects across studies, including several adverse effects meant a significant downgrading of the available evidence. This downgrading is mitigated by problems of implementation discussed in several reports, indicating that implementation or other issues may moderate the effects of participative interventions. Therefore, we decided that the quality of evidence should be rated as 'initial'. Moreover, conclusions regarding performance were made on the basis of studies that also assessed well-being. Given the inconsistency in the evidence reviewed, we cannot recommend participative interventions for enhancing well-being via enhancing job design:

> Evidence statement 3: Participatory approaches to improving job design have mixed effects on well-being, job design and performance, including adverse outcomes in some circumstances.

In all but one study (Bartunek et al. 2006), the interventions were focused on worker welfare and there were mixed findings with participative interventions focused on worker welfare. Therefore, although there is not enough evidence to state whether a focus on worker welfare is a necessary condition, the mixed evidence does indicate a focus on worker welfare is not a sufficient condition for participative interventions to improve well-being.

Evidence statement 3 should not be taken to indicate that participation is not important. Our analysis of implementation issues across all of the interventions studied indicates that worker engagement and participation with the intervention can be important (see later section on implementation processes). Worker engagement and participation is also consistent with many prominent models of organisational and systems change (Armenakis, Harris, and Mossholder 1993**;** Beer, Eisenstat, and Spector 1990; Cherns 1987; Rafferty, Jimmieson, and Armenakis 2013). It may be the case that other forms of complex intervention, for example involving management-led or directed job redesign, require worker participation to be successful. However, interventions based solely on worker participation may be subject to numerous factors involved with group dynamics and uneven distribution of power in work teams. Therefore, at present, and without further evidence on what contingencies influence the success or otherwise of participative interventions, we consider worker participation to be an important element of other kinds of intervention for job redesign rather than a useful intervention in of and by itself.

One study (Poulsen et al. 2007) indicates participative interventions can have a beneficial effect on subjective well-being, physical health, job design and performance indicators. The study reported on a holistic and systemic intervention that resulted in many changes across an entire organisation including changes to job design but also encompassing other interventions to improve well-being. Given the scale of the changes in the organisation, this intervention shares features in common with interventions focused on system wide changes that included changes to job design alongside multiple and broad changes to other organisational processes. These system wide interventions are reviewed later.

Discussion and summary: redesigning jobs through changing employment practices

Our review indicates that training workers to improve their own jobs shows the most promise as a means of using employment practices to improve well-being through enhanced job quality. However, more research with stronger designs is needed on training workers and also training leaders to improve job quality. For participatory interventions, although some studies demonstrated benefits on job quality, subjective well-being, other indicators of well-being and performance, there were some indications of adverse effects on job quality, well-being and performance. However, there were no adverse effects on subjective well-being in the participatory interventions. Even so, more research on participatory interventions may reveal when the effects are positive and when they are null or adverse.

For interventions focused on worker welfare, the ratio of interventions showing improvements in well-being to the total number of interventions was 7:13. For interventions not specifically targeted at worker welfare, the ratio was 6:7. Therefore, it appears for interventions that use employment practices as instruments for job redesign, a specific and explicit focus on well-being does not matter. However, perhaps because many of the interventions were worker-led, the interventions could have an implicit consideration of workers' interests.

Across all intervention types, where there were improvements in subjective and other forms of well-being, there also tended to be an improvement in job design. The ratio of improvements in both subjective well-being and the broader class of well-being indicators to improvements in job design was: 9:12 across all intervention types, 4:5 for training workers, 2:3 for training leaders and 3:4 for participatory interventions. In those interventions where job design did not improve, there was also no improvement in any indicators of well-being (3:3 across all intervention types, 1:1 for training workers, 0:0 for training leaders and 2:2 for participatory interventions). The high ratios indicate that job redesign may be likely to mediate the relationship between training or participatory processes and a wide range of well-being indicators. Therefore, there is evidence that where interventions realise improvements in job quality, there is a better chance that well-being improves.

The ratio of improvements in performance to improvements in job design was: 4:7 across all intervention types,

2:2 for training workers, 1:2 for training leaders and 2:3 for participatory interventions. The lower ratio for performance compared to well-being may indicate the presence of additional moderator or mediator effects between enhanced job design and performance. One candidate mediator for improved performance is improved well-being. However, the evidence from the studies reviewed here is equivocal. In four out of six interventions where there was an improvement in subjective well-being, there was also an improvement in performance. In five out of seven cases where there was an improvement in any form of well-being, there was also an improvement in performance.

Studies of interventions where job design is augmented by other employment practices

Both categories of intervention reviewed in this section were concerned with using different employment practices to augment the effects of job redesign. Therefore, we investigated whether additive or moderated effects characterised the augmentation process.

Studies focused on combined effects of aspects of job design and training

For this category of interventions, we examined six studies (two randomised control trials, two non-equivalent control group designs and two pre-post-test only with no control group designs). All interventions involved training focused either on worker welfare and/or mental health issues: one intervention involved training in risk assessment (d'Ettorre and Greco 2015), one involved ergonomics training (Robertson et al. 2008), and three involved components focused on mental health issues at work or stress management (Uchiyama et al. 2013; Umanodan et al. 2009, 2014). One study was concerned with training generic mental health skills so health workers could deliver better care to patients (Jones et al. 2008). Some 782 workers were exposed to some sort of intervention. Four of the six studies introduced changes in some aspects of job design alongside training (d'Ettorre and Greco 2015; Jones et al. 2008; Robertson et al. 2008; Uchiyama et al. 2013). None of these four studies used fully factoral designs, in which there was a control group, a group that received training only, a group that experienced job redesign only and a group that experienced job redesign and received training. Therefore, none of these four intervention studies provided strong inferences on whether any augmentation effects of training alongside job redesign represented additive or moderated processes. Two of the studies examined whether the impact of training was higher for workers in better designed jobs (Umanodan et al. 2009, 2014). Post-intervention assessments of change in focal variables varied from very short (0 months after the intervention) to 24 months post-intervention. Two studies conducted post-intervention assessments after three months or less.

All but one of the studies (Uchiyama et al. 2013) in this category of interventions demonstrated evidence that interventions comprising training and improvements in job design can improve well-being (both across indicators of subjective well-being and a broader range of well-being indicators). There was no evidence of adverse effects on well-being. Removing studies with weaker pre-post test only no control group designs, and retaining only randomised control trials or non-equivalent control group designs leaves a ratio of three studies showing some beneficial effects to one study showing no effects. As noted in the previous section, one cluster randomised trial examined an intervention that simultaneously focused on improving problem-solving and aspects of job design with a 12-month follow-up (Le Blanc et al. 2007). This study demonstrated beneficial effects on well-being. However, a smaller study (Van Wingerden, Derks, and Bakker 2017) with a much short follow-up period and lower sample size indicated no effects on well-being for training focused simultaneously on personal development and improving job design. Taken together however, there does appear to be support that simultaneously introducing training alongside enhanced job design improves well-being.

However, whereas three studies indicated beneficial effects across 50% or more of well-being indicators (both subjective and the broader set of indicators), two studies (Umanodan et al. 2009, 2014) indicated positive effects of job design combined with training across a minority of indicators of well-being. These two studies did not assess the joint effects of training and job design interventions, rather these studies examined whether the impact of training was higher for workers in high quality jobs. Restricting our analyses to studies that examined joint training and job redesign interventions, the ratio of studies showing beneficial effects to null effects is 3:1.

In relation to performance, two studies indicated null effects (Umanodan et al. 2009, 2014). These were the two studies that showed limited effects on well-being and examined whether the impact of training was higher for workers in high quality jobs. Both these studies used self-reports of performance. One study indicated a positive effect on performance (Robertson et al. 2008). As well as enhancing job design and introducing training simultaneously, this study examined performance at the unit level rather than the level of the individual worker. As noted in the previous section, a short-term study with a small sample (Van Wingerden, Derks, and Bakker 2017) also indicated an effect of an intervention focused on personal development and job design on self-reported performance.

Three of the studies reported unique effects of training as well as augmenting effects with job design (Robertson et al. 2008; Umanodan et al. 2009, 2014). All three indicated beneficial effects of training for well-being indicators and two (Umanodan et al. 2009, 2014) indicated beneficial effects of training for self-report indicators of performance. However, for two studies, the beneficial effects were for those that engaged more with the training rather than those just assigned to training conditions (Umanodan et al. 2009, 2014). Taking the results of the unique effects of training together with results on the joint effects of training and job design, it may be concluded that introducing enhanced job design alongside training may have beneficial augmenting effects on well-being and performance because of either synergistic effects between training and job design or because of unique effects of training.

However, because there were only two randomised control trials (Umanodan et al. 2009, 2014), both of which showed null or equivocal benefits of the intervention, there is insufficient rationale to apply the 'strong' grading to the quality of the evidence. Moreover, conclusions regarding performance were made on the basis of studies that also assessed well-being. Because results are inconsistent even if tending towards the positive, we have moved the quality of evidence evaluation to 'promising':

> Evidence statement 4: Training coupled with direct improvements with job design may improve well-being, and may, in some cases, also improve performance.

Contextual factors may warrant further investigation. For example, one study (Uchiyama et al. 2013) reported on the introduction of training alongside attempts to improve job design via participatory processes. This study returned null effects on well-being and there was limited evidence of improvements in job design. Because of the focus on participatory approaches, this study shares features in common with interventions reviewed in the section concerned with participatory approaches above. Notwithstanding, all but one of the studies were focused on worker welfare (the other however was focused on health, Jones et al. 2008), and all were focused on welfare and/or were participative. Therefore, it may be the case that joint training and job design interventions should be focused on welfare and perhaps also include participative elements alongside other management-led changes.

Interventions focused on system wide changes

Four studies assessed interventions that were more systemic. Three studies introduced enhancements in job design alongside a range of other changes in human resource management practices (Elke and Zimolong 2005; Rickard et al. 2012; Tregaskis et al. 2013). Because of the complexity of the intervention in each case, it was not possible to examine the unique effects of each discrete change in job design or employment practices or determine the synergistic effects of particular combinations of changes. One study examined the joint impact of the introduction of a new resource planning system alongside existing levels of job design (Morris and Venkatesh 2010). Some 3096 workers were exposed to interventions in studies using a non-equivalent control group design (Elke and Zimolong 2005), a mixed interrupted time series design to assess impact on performance and pre-post test only with no control group design to assess impact on well-being (Tregaskis et al. 2013), and two studies using pre-post test only with no control group designs (Morris and Venkatesh 2010; Rickard et al. 2012).

One study (Morris and Venkatesh 2010) indicated an adverse effect on job satisfaction of the introduction of a new resource planning system for workers with high levels of job autonomy. Although this intervention did include some employment practices (training in the new system, worker participation in system development) and could have influenced employment practices (e.g. allocation of training budgets, human resource planning), the changes to employment practices may not be an extensive or as focused as found in the other three interventions examined.

Beneficial effects of the interventions were found for the broad range of well-being indicators, subjective well-being indicators, and performance for three of the other studies (Elke and Zimolong 2005; Rickard et al. 2012; Tregaskis et al. 2013). For these three studies there were no completely null or adverse effects. In relation to performance, two studies used indicators from company records (Elke and Zimolong 2005; Tregaskis et al. 2013). One key factor differentiates the studies showing beneficial effects for interventions from the study showing an adverse effect: Where beneficial effects were found, the interventions were focused on enhancing worker welfare. Similarly, a beneficial, extensive and organisation wide participatory intervention, reviewed in the previous section, was also focused on worker welfare (Poulsen et al. 2007).

Because there were no randomised control trials, the evidence on system wide approaches cannot be classified as of 'strong' quality according the evidence classification. Moreover, conclusions regarding performance were made on the basis of studies that also assessed well-being. However, because there were consistent effects on well-being and performance across all three interventions focused on worker welfare and one other holistic, multifaceted intervention reviewed in the previous section, we considered that the quality of the evidence should graded as 'promising':

> Evidence statement 5: System wide approaches, that simultaneously enhance job design and a range of other

management practices and that are focused on worker welfare, may improve well-being and performance.

We believe implementation issues are likely to be an important factors in the success of system wide approaches, and we will review these in a subsequent section. Moreover, given the scale of change, cost and cost effectiveness may also be an issue.

Discussion and summary: augmenting job redesign

Both sets of interventions focused on augmenting the effects of job redesign revealed positive effects on subjective well-being and the broader class of well-being indicators (a ratio of 8:10 studies overall, 5:6 studies focused on augmenting job design with training, and 3:4 focused on augmenting job design with a range of employment practices). Moreover, there was a high ratio of positive effects on well-being for interventions specifically targeted at worker welfare (7:8 overall, 4:5 studies focused on augmenting job design with training, and 3:3 focused on augmenting job design with a range of employment practices). Therefore, it appears a focus on worker welfare could be important for these interventions. This conclusion is tentative, because there was only one intervention (Morris and Venkatesh 2010) that was not focused on worker welfare or some aspect of health. Similarly, there were also positive effects on performance in some studies (4:6 studies overall, 1:3 studies focused on augmenting job design with training, and 3:3 focused on augmenting job design with a range of employment practices). Of those studies demonstrating an impact on performance, four out of four (1:1 training and job redesign, 3:3 systemic interventions) also indicated beneficial effects on well-being. The two studies that did not show effects on performance evidenced relatively limited improvements in a range of well-being indicators (Umanodan et al. 2009, 2014). Therefore, there is some evidence improvements in well-being may mediate improvements in performance, or at least performance and well-being goals need not be in conflict.

There is a need for more intervention studies using stronger research designs. Moreover, none of the intervention designs were able to provide inferences whether the augmentation effects of other employment practices operate in an additive or synergistic fashion: Interventions usually introduced many changes simultaneously, rather than introducing discrete combinations of changes in fully factoral designs to allow statistical investigation of moderation effects. However, given that previous reviews indicate that interventions focused solely on job redesign have equivocal effects (Bambra et al. 2007, 2008; Bhui et al. 2012; Richardson and Rothstein 2008; Ruotsalainen et al. 2008; Van der Klink et al. 2001), and because of theoretical considerations (Appelbaum et al. 2000; Cherns 1987; Clegg 2000; Combs et al. 2006; Davis et al. 2013), we believe that there is a good chance that moderation characterises the process and that investigating moderator effects of employment practices on job design is a fruitful line of enquiry. Given the cost of implementing job redesign interventions, moderator hypotheses may be best tested with other methods (e.g. longitudinal surveys). In addition, the results suggest a moderating role for having interventions focused on worker welfare, which may be particularly important for more systemic changes (Van De Voorde, Paauwe, and Van Veldhoven 2012).

Implementation processes

Two studies focused exclusively on issues concerned with the implementation of interventions but contained no information on the well-being or performance outcomes of those interventions (Greasley and Edwards 2015; Nielsen, Abildgaard, and Daniels 2014). Both involved long term follow-ups after the introduction of an intervention of 12 (Greasley and Edwards 2015) and 24 months (Nielsen, Abildgaard, and Daniels 2014). One study is a mixed methods used a pre–post test only design with no control group (Greasley and Edwards 2015) and the other reports qualitative data from a mixed methods non-equivalent control group study (Nielsen, Abildgaard, and Daniels 2014). In total, qualitative data were gathered from 104 people across the two studies and questionnaire data from 383 workers in one study (Greasley and Edwards 2015). Data from the two studies focused exclusively on implementation issues were supplemented from 10 other studies included in the other parts of this review and that had examined the effects of the intervention on well-being. These ten studies were examined because mixed methods had been used, the authors had speculated on reasons for the success or failure of an intervention, or sufficient contextual information was supplied to extract possible salient contextual features about the implementation of the intervention.

In developing our evidence statements, we looked for consistency across several studies, and gave additional weight to the two studies focused on implementation because these two studies had presented more extensive qualitative data to justify their conclusions. We also looked across studies for contradictory evidence.

We concluded that there was sufficient grounds to classify the evidence statements as receiving 'promising' on the evidence classification because: the weight and consistency of evidence for each statement – three evidence statements were supported by one of the implementation focused studies, and all were supported by at least five studies; and across the studies, data were collected from sufficient numbers of people to be confident the data were

robust across contexts. In some cases, statements are also consistent with existing theoretical approaches to change or systems integration.

Our evidence statements in respect of implementation issues are as follows:

> Evidence statement 6i) Contextually grounded and/or participative methods may provide a basis for interventions to improve job design

Support for this statement comes from: Nielsen, Abildgaard, and Daniels (2014) as well as Elke and Zimolong (2005), Sørensen and Holman (2014), Tregaskis et al. (2013) and Uchiyama et al. (2013).

We consider that evidence statement 6i applies to involving workers in designing the intervention so that it addresses issues are relevance to them. This may involve engaging with workers to understand their concerns in their language about their context rather than using standardised questionnaire instruments (Nielsen, Abildgaard, and Daniels 2014; see also Daniels, Harris, and Briner 2004). Participation and contextually sensitive methods may not be so relevant for interventions concerned with training workers to improve their own job design (see evidence statement 1), although we would expect training programmes to include participative elements in the form of in-session exercises and discussions. Moreover, by training workers to improve their own job, there is an implied, self-directed element to the intervention. Also, as evidence statement 3 implies, participation may be necessary for successful implementation of an intervention but it may be insufficient in of and by itself as a well-being intervention: That is, participation is an important implementation factor but it should be introduced alongside other interventions to improve job design. Participative elements may be very important for interventions that attempt to enhance job design through directly changing working practices and processes (Cherns 1987; Clegg 2000; Davis et al. 2013). It may be the case that workers may need training in communication and other skills in order to ensure effective participation (Tregaskis et al. 2013).

> Evidence statement 6ii). Managerial commitment is important but may be insufficient by itself

Support for this statement comes from: Greasley and Edwards (2015) as well as Dahl-Jorgensen and Saksvik (2005), Elke and Zimolong (2005), Kobayashi et al. (2008), Sørensen and Holman (2014) and Tregaskis et al. (2013).

Evidence statement 6ii is consistent with theories of change (e.g. Armenakis and Bedeian 1999; Armenakis, Harris, and Mossholder 1993**;** Kotter 1995; Rafferty, Jimmieson, and Armenakis 2013). Evidence statement 2 indicates there is no robust evidence that training managers will enhance workers' job design. However, it may be that well-being initiatives should include some level of management development to ensure managers have positive attitudes to job redesign and well-being and do not undermine efforts to improve job design, either by the workers themselves or through change to wider organisational systems.

> Evidence statement 6iii). It may be important to integrate well-being interventions with other systems

Support for this statement comes from: Greasley and Edwards (2015) as well as Dahl-Jorgensen and Saksvik (2005), Eklof and Hagberg (2006), Elke and Zimolong (2005), Elo et al. (2008)/Mattila et al. (2006), Le Blanc et al. (2007) and Poulsen et al. (2007).

Evidence statement 6iii is both consistent with theories of organisational change (e.g. Armenakis and Bedeian 1999; Armenakis, Harris, and Mossholder 1993**;** Kotter 1995; Rafferty, Jimmieson, and Armenakis 2013) and sociotechnical systems theory of how humans work in complex systems such as work organisations (Cherns 1987; Clegg 2000; Davis et al. 2013). Integration ensures that performance is not compromised for well-being and that intentions to improve well-being are not undermined by other organisational processes. As evidence statement 5 indicates, a focus on worker welfare is important, and the existing evidence indicates that when worker welfare is integrated into system wide change, there are performance benefits for organisations.

> Evidence statement 6iv). Worker engagement may be important including voluntary engagement in participative elements and it may be important for engagement to be widescale

Support for this statement comes from: Dahl-Jorgensen and Saksvik (2005), Elo et al. (2008)/Mattila et al. (2006), Kobayashi et al. (2008), Odle-Dusseau et al. (2016), Uchiyama et al. (2013), Poulsen et al. (2007) and Umanodan et al. (2009, 2014).

Evidence statement 6iv is both consistent with theories of organisational change (e.g. Beer, Eisenstat, and Spector 1990) and sociotechnical systems theory (Cherns 1987; Clegg 2000; Davis et al. 2013)). As with noted in respect of evidence statement 3 and 6i, participation may be necessary for successful implementation of an intervention but it may be insufficient. Engagement may be dependent on developing positive worker attitudes to job design and well-being.

Conclusions

In this systematic review, we sought answers to four questions: (1) Do employment practices have a role as interventions to (a) improve job design and hence well-being or (b) as augmenters of interventions to improve job design and hence well-being?; (2) Does the focus of job redesign matter for improving well-being, for example whether job

redesign is targeted at productivity (e.g. through introducing new technologies, for efficiency) or targeted at well-being? (3) Do the interventions investigated in this review also influence performance?; (4) What factors influence the successful implementation of the interventions investigated?

In relation to the first and third question, of the interventions investigated, we found that enhanced well-being and enhanced performance is most likely to be associated with job redesign coupled with training and job redesign coupled with extensive, system wide changes to employment practices. There is evidence that training workers to improve the quality of their own jobs may enhance well-being and performance in some circumstances. Our review indicates that interventions that appear to improve subjective well-being also improve other indicators of well-being. In relation to the second question, the evidence indicates a focus on worker welfare is important for complex, multifaceted interventions that include job redesign and could be important for interventions that augment job redesign with training. For interventions that use other employment practices as instruments for job redesign, there is either insufficient evidence to make claims regarding whether interventions should focus on worker welfare (training leaders in job redesign), evidence that a focus on worker welfare is insufficient (participative interventions) or evidence that the focus may not matter (training workers to improve their own jobs). In relation to the fourth question, our analysis of implementation issues indicates that worker participation in interventions is important, but worker participation needs to be supported by several other process factors, such as management commitment, integration with other organisational systems and initiatives to promote worker engagement, because participation may not necessarily ensure engagement by itself.

Our review has suggested that some of the interventions that are most likely to be most successful are those that combine job redesign with other employment practices (training or more extensive changes to employment practices). Although this may be taken to indicate other employment practices moderate job redesign, on the basis of the intervention evidence reviewed we cannot state whether a moderated or additive model characterises the processes through how the interventions work. In practical terms, this may not matter: Given that previous reviews have indicated job redesign by itself has equivocal effects (Bambra et al. 2007, 2008; Bhui et al. 2012; Richardson and Rothstein 2008; Ruotsalainen et al. 2008; Van der Klink et al. 2001), this review had indicated that job redesign may require some form of augmentation regardless of whether that augmentation is an additive processes that elevates job redesign above a given threshold of statistical or practical significance or a process characterised by moderation.

As our review and others have indicated (Corbière et al. 2009), studies of interventions with a job redesign component are rare. Therefore, conclusions concerning such interventions focus on key points of similarity between sub-classes of intervention (e.g. the five types of intervention examined in this review) rather than focusing on the same intervention implemented across different contexts. Although this may seem a limitation in scientific terms, in practical terms it may be considered a strength because conclusions point to general principles that can guide interventions to be tailored to specific contexts.

The review has highlighted several areas for research on job redesign. First, there is clearly a need for more research on interventions that couple job redesign with training or more extensive changes to employment practices in order to further expand the range of empirical work. There is also a need for more research on training workers and their managers to improve the quality of workers' job design, and such research requires longer term follow-ups to explore any accumulative effects of training. There is also a need to explore implementation issues in greater detail. Although there was consistency across several studies, the findings on implementation did not reach the highest quality ratings. In general, researchers need to explore more powerful designs, such as randomised controlled, non-equivalent control group and interrupted time series designs. There is also a gap in the evidence on the cost effectiveness of interventions. Although there is some evidence that there could be a return on investment for some interventions through improvements in performance, we only reviewed studies that assessed performance alongside well-being rather than studies of performance that did not assess well-being. As our review focused on advanced industrial democracies, there is a gap in terms of synthesising evidence from research in other national contexts.

The present review has focused on complex interventions. The requirement for the different components of interventions to fit together and to fit with wider organisational and perhaps extra-organisational contexts requires expertise in design and complex, open systems. Moreover, theories of job design and theories of employment practices focus on the content of work and employment practices (e.g. Appelbaum et al. 2000; Karasek and Theorell 1990), but do not yet integrate theories of how to change that content in complex, open systems. Theoretically and conceptually, there is a gap in our knowledge of how best to design and implement complex interventions that couple job redesign with other employment practices.

Acknowledgement

This work is part of the Work, Learning and Well-being programme of the What Works Well-being Centre (www.whatworkswell-being.org). We acknowledge the support of our funding partners, administered through Economic and Social Research Council Grant ES/N003586/1. We would like to thank Constanze Eib, Roberta Fida and Mariella Miraglia for their help in sifting non-English language publications. For their feedback on our search terms, we would like to thank Neil Anderson, Arnold Bakker, Richard Dorsett, Marylene Gagné, David Holman, Ivan Robertson, Wilmar Schaufeli, Stephen Stansfeld, Susana Tavares, Nick Turner, Anja Van den Broeck, Beatrice van der Heijden, Marc van Veldhoven and Despoina Xanthopoulou. For feedback on the quality ratings, we would like to thank Sara MacLennan. Supplementary material for this paper can be obtained from Kevin Daniels' Research gate page or by email.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Economic and Social Research Council [grant number ES/N003586/1].

ORCID

Kevin Daniels http://orcid.org/0000-0002-8620-886X

References

(* denotes included in the review)

All Parliamentary Work Group on Wellbeing Economics. 2014. *Wellbeing in Four Policy Areas*. London: New Economics Foundation.

Appelbaum, E. M., T. Bailey, P. Berg, and A. Kalleberg. 2000. *Manufacturing Competitive Advantage: The Effects of High Performance Work Systems on Plant Performance and Company Outcomes*. Ithaca, NY: Cornell University Press.

Armenakis, A. A., and A. G. Bedeian. 1999. "Organizational Change: A Review of Theory and Research in the 1990s." *Journal of Management* 25: 293–315.

Armenakis, A. A., S. G. Harris, and K. W. Mossholder. 1993. "Creating Readiness for Organizational Change." *Human Relations* 46: 681–703.

Bambra, C., M. Egan, S. Thomas, M. Petticrew, and M. Whitehead. 2007. "The Psychosocial and Health Effects of Workplace Reorganisation. 2. A Systematic Review of Task Restructuring Interventions." *Journal of Epidemiology and Community Health* 61: 1028–1037.

Bambra, C. L., M. M. Whitehead, A. J. Sowden, J. Akers, and M. P. Petticrew. 2008. "Shifting Schedules: The Health Effects of Reorganizing Shift Work." *American Journal of Preventive Medicine* 34: 427–434.e30.

*Bartunek, J. M., D. M. Rousseau, J. W. Rudolph, and J. A. DePalma. 2006. "On the Receiving end: Sensemaking, Emotion, and Assessments of an Organizational Change Initiated by Others." *The Journal of Applied Behavioral Science* 42: 182–206.

Beer, M., R. A. Eisenstat, and B. Spector. 1990. "Why Change Programs Don't Produce Change." *Harvard Business Review* 68 (6): 158–166.

Bhui, K.S., Dinos, S., Stansfeld, S.A., & White, P.D. (2012). "A Synthesis of the Evidence for Managing Stress at Work: A Review of the Reviews Reporting on Anxiety, Depression, and Absenteeism." *Journal of Environmental and Public Health* 2012. doi:10.1155/2012/515874.

*Biggs, A., P. Brough, and J. P. Barbour. 2014. "Enhancing Work-related Attitudes and Work Engagement: A Quasi-experimental Study of the Impact of an Organizational Intervention." *International Journal of Stress Management* 21: 43–68.

Biron, C., M. Karanika-Murray, and C. L. Cooper. 2012. "What Works, for Whom, in Which Context? Researching Organizational Interventions on Psychosocial Risks Using Realistic Evaluation Principles." In *Improving Organizational Interventions for Stress and Well-being: Addressing Process and Context*, edited by C. Biron, M. Karanika-Murray and C. L. Cooper, 163–183. London: Routledge.

Cherns, A. 1987. "Principles of Sociotechnical Design Revisted." *Human Relations* 40: 153–161.

Clegg, C. W. 2000. "Sociotechnical Principles for System Design." *Applied Ergonomics* 31: 463–477.

*Cohen, M., and R. Gagin. 2005. "Can Skill-development Training Alleviate Burnout in Hospital Social Workers?" *Social Work in Health Care* 40: 83–97.

Combs, J., Y. Liu, A. Hall, and D. Ketchen. 2006. "How Much do High-performance Work Practices Matter? A Meta-analysis of their Effects on Organizational Performance." *Personnel Psychology* 59: 501–528.

*Coogle, C., C. Head, and I. Parham. 2006. "The Long-term Care Workforce Crisis: Dementia-care Training Influences on Job Satisfaction and Career Commitment." *Educational Gerontology* 32: 611–631.

Corbière, M., J. Shen, M. Rouleau, and C. S. Dewa. 2009. "A Systematic Review of Preventive Interventions regarding Mental Health Issues in Organizations." *Work* 33: 81–116.

Cousins, R., C. J. MacKay, S. D. Clarke, C. Kelly, P. J. Kelly, and R. H. McCaig. 2004. "'Management Standards' Work-related Stress in the UK: Practical Development." *Work & Stress* 18: 113–136.

*Dahl-Jorgensen, C., and P. O. Saksvik. 2005. "The Impact of Two Organizational Interventions on the Health of Service Sector Workers." *International Journal of Health Services* 35: 529–549.

Daniels, K., C. Harris, and R. B. Briner. 2004. "Linking Work Conditions to Unpleasant Affect: Cognition, Categorization and Goals." *Journal of Occupational and Organizational Psychology* 77: 343–363.

Daniels, K., M. L. Bryan, S. Connolly, C. Ogbonnaya, A. Robinson-Pant, J. Street, and O. Tregaskis. 2016. *Stakeholder Perspectives on Policy Priorities for Improving National Wellbeing through Work and Adult Learning*. Berkeley, CA: Society for the Advancement of Socio-Economics.

Davis, M. C., R. Challenger, D. N. W. Jayewardene, and C. W. Clegg. 2013. "Advancing Socio-technical Thinking: A Call for Bravery." *Applied Ergonomics* 1–10.

Diener, E. 1984. "Subjective Well-being." *Psychological Bulletin* 95: 542–575.

Diener, E., and R. J. Larsen. 1993. "The Experience of Emotional Well-being." In *Handbook of Emotions*, edited by M. Lewis and J. M. Havilland, 405–415. New York: Guildford Press.

*Eklof, M., and M. Hagberg. 2006. "Are Simple Feedback Interventions Involving Workplace Data Associated with Better Working Environment and Health? A Cluster Randomized Controlled Study among Swedish VDU Workers." *Applied Ergonomics* 37: 201–210.

*Elke, G., and B. Zimolong. 2005. "Eine Interventionsstudie zum Einfluss des Human Resource Managements im betrieblichen Arbeits- und Gesundheitsschutz." [An Intervention Study of the Impact of Human Resource Management Concerning Occupational Health and Safety.] *Zeitschrift fur Arbeits- und Organisationspsychologie* 49: 117–130.

*Ellis, M. V., H. Hutman, and J. Chapin. 2015. "Reducing Supervisee Anxiety: Effects of a Role Induction Intervention for Clinical Supervision." *Journal of Counseling Psychology* 62: 608–620.

*Elo, A.-L., J. Ervasti, E. Kuosma, and P. Mattila. 2008. "Evaluation of an Organizational Stress Management Program in a Municipal Public Works Organization." *Journal of Occupational Health Psychology* 13: 10–23.

*Elo, A.-L., J. Ervasti, E. Kuosma, and P. Mattila-Holappa. 2014. "Effect of a Leadership Intervention on Subordinate Well-being." *Journal of Management Development* 33: 182–195.

*d'Ettorre, G., and M. Greco. 2015. "Healthcare Work and Organizational Interventions to Prevent Work-related Stress in Brindisi, Italy." *Safety and Health at Work* 6: 35–38.

Ferguson, E., K. Daniels, and D. Jones. 2006. "Negatively Oriented Personality and Perceived Negative Job Characteristics as Predictors of Future Psychological and Physical Symptoms: A Meta-analytic Structural Modelling Approach." *Journal of Psychosomatic Research* 60: 45–52.

*Glisson, C., A. Hemmelgarn, P. Green, D. Dukes, S. Atkinson, and N. J. Williams. 2012. "Randomized Trial of the Availability, Responsiveness, and Continuity (ARC) Organizational Intervention with Community-based Mental Health Programs and Clinicians Serving Youth." *Journal of the American Academy of Child and Adolescent Psychiatry* 51: 780–787.

Grant, A. M., and S. K. Parker. 2009. "Redesigning Work Design Theories: The Rise of Relational and Proactive Perspectives." *The Academy of Management Annals* 3: 317–375.

*Greasley, K., and P. Edwards. 2015. "When Do Health and Well-being Interventions Work? Managerial Commitment and Context." *Economic & Industrial Democracy* 36: 355–377.

Grote, G., and D. Guest. 2017. "The Case for Reinvigorating Quality of Working Life Research." *Human Relations* 70: 149–167.

Hackman, J. R., and G. R. Oldham. 1976. "Motivation Through the Design of Work: Test of a Theory." *Organizational Behavior and Human Performance* 16: 250–279.

*van den Heuvel, M., E. Demerouti, and M. C. W. Peeters. 2015. "The Job Crafting Intervention: Effects on Job Resources, Self-efficacy, and Affective Well-being." *Journal of Occupational and Organizational Psychology* 88: 511–532.

Higgins, J. P., and S. Green, eds. 2008. *Cochrane Handbook for Systematic Reviews of Interventions*, Vol. 5. Chichester: Wiley-Blackwell.

Humphrey, S. E., J. D. Nahrgang, and F. P. Morgeson. 2007. "Integrating Motivational, Social, and Contextual Work Design Features: A Meta-analytic Summary and Theoretical Extension of the Work Design Literature." *Journal of Applied Psychology* 92: 1332–1356. doi:10.1037/0021-9010.92.5.1332.

Jones, M., A. Tyrer, T. Kalekzi, and S. Lancashire. 2008. "Research Summary: The Effect of Whole Team Training in Evidence-based Interventions on the Knowledge, Well-being and Morale of Inpatient Mental Health Workers." *Journal of Psychiatric and Mental Health Nursing* 15: 784–786.

Jones, W., R. Haslam, and C. Haslam. 2017. "What is a 'Good' Job? Modelling Job Quality for Blue Collar Workers." *Ergonomics* 60: 138–149.

Karasek, R. A., and T. Theorell. 1990. *Healthy Work*. New York: Basic Books.

*Kobayashi, Y., A. Kaneyoshi, A. Yokota, and N. Kawakami. 2008. "Effects of a Worker Participatory Program for Improving Work Environments on Job Stressors and Mental Health among Workers: A Controlled Trial." *Journal of Occupational Health* 50: 455–470.

Kotter, J. P. 1995. "Leading Change: Why Transformation Efforts Fail." *Harvard Business Review* 73 (2): 59–67.

*Le Blanc, P. M., J. J. Hox, W. B. Schaufeli, Toon W. Taris, and Maria C. W. Peeters. 2007. "Take Care! The Evaluation of a Team-based Burnout Intervention Program for Oncology Care Providers." *Journal of Applied Psychology* 92: 213–227.

Lewin, S., C. Glenton, H. Munthe-Kaas, B. Carlsen, C. J. Colvin, M. Gülmezoglu, J. Noyes, A. Booth, R. Garside, and A. Rashidian. 2015. "Using Qualitative Evidence in Decision Making for Health and Social Interventions: An Approach to Assess Confidence in Findings from Qualitative Evidence Syntheses (GRADE-CERQual)." *PLOS Medicine* 12: e1001895. doi:10.1371/journal.pmed.1001895.

Liberati, A., D. G. Altman, J. Tetzlaff, C. Mulrow, P. C. Gøtzsche, J. P. A. Ioannidis, M. Clarke, P. J. Devereaux, K. Kleijnen, and D. Moher. 2009. "The PRISMA Statement for Reporting Systematic Reviews and Meta-analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration." *PLoS Medicine* 6: e1000100. doi:10.1371/journal.pmed.1000100.

*Linden, M., B. Muschalla, T. Hansmeier, and G. Sandner. 2014. "Reduction of Sickness Absence by an Occupational Health Care Management Program Focusing on Self-efficacy and Self-management." *Work* 47: 485–489.

Martinaityte, I., Sacramento, C., & Aryee, S. (in press). Delighting the Customer: Creativity-oriented High-performance Work Systems, Frontline Employee Creative Performance, and Customer Satisfaction. *Journal of Management*. doi:0149206316672532.

*Mattila, P., A. L. Elo, E. Kuosma, and E. Kylä-Setälä. 2006. "Effect of a Participative Work Conference on Psychosocial Work Environment and Well-being." *European Journal of Work and Organizational Psychology* 15: 459–476.

Morgeson, F. P., and S. E. Humphrey. 2008. "Job and Team Design: Toward a More Integrative Conceptualization of Work Design." *Research in Personnel and Human Resources Management* 27: 39–91.

*Morris, M. G., and V. Venkatesh. 2010. "Job Characteristics and Job Satisfaction: Understanding the Role of Enterprise Resource Planning System Implementation." *MIS Quarterly* 34: 143–161.

Naghieh, A., Montgomery, P., Bonell, C.P., Thompson, M., Aber, J.L. (2015). Organisational Interventions for Improving Well-being and Reducing Work-related Stress in Teachers. *Cochrane Database of Systematic Reviews 2015*, Art. No.: CD010306. doi:10.1002/14651858.CD010306.pub2

Neuman, G. A., J. E. Edwards, and N. S. Raju. 1989. "Organizational Development Interventions: A Meta-analysis of their Effects on Satisfaction and Other Attitudes." *Personnel Psychology* 42: 461–489.

Nielsen, K., J. S. Abildgaard, and K. Daniels. 2014. "Putting Context into Organizational Intervention Design: Using Tailored Questionnaires to Measure Initiatives for Worker Well-being." *Human Relations* 67: 1537–1560.
Nieuwenhuijsen, K., D. Bruinvels, and M. Frings-Dresen. 2010. "Psychosocial Work Environment and Stress-related Disorders, a Systematic Review." *Occupational Medicine* 60: 277–286.
O'Donnell, G., A. Deaton, M. Durand, D. Halpern, and R. Layard. 2014. *Well-being and Policy*. London: Legatum Institute.
*Odle-Dusseau, H. N., L. B. Hammer, T. L. Crain, and T. E. Bodner. 2016. "The Influence of Family-supportive Supervisor Training on Employee Job Performance and Attitudes: An Organizational Work-family Intervention." *Journal of Occupational Health Psychology* 21: 296–308.
Ogbonnaya, C., K. Daniels, S. Connolly, and M. van Veldhoven. 2017. "Integrated and Isolated Impact of High-performance Work Practices on Employee Health and Well-being: A Comparative Study." *Journal of Occupational Health Psychology* 22: 98–114.
Ogilvie, D., D. Fayter, M. Petticrew, A. Sowden, S. Thomas, M. Whitehead, and G. Worthy. 2008. "The Harvest Plot: A Method for Synthesising Evidence about the Differential Effects of Interventions." *BMC Medical Research Methodology* 8. doi:10.1186/1471-2288-8-8.
Parker, S. K., and S. Ohly. 2008. "Designing Motivating Work." In *Work Motivation: Past, Present and Future*, edited by R. Kanfer, G. Chen and R. Pritchard, 233–384. New York: Routledge.
*Poulsen, K. B., S. H. Jensen, E. Bach, and J. F. Schostak. 2007. "Using Action Research to Improve Health and the Work Environment for 3500 Municipal Bus Drivers." *Educational Action Research* 15: 75–106.
Rafferty, A. E., N. L. Jimmieson, and A. A. Armenakis. 2013. "Change Readiness a Multilevel Review." *Journal of Management* 39: 110–135.
Richardson, K. M., and H. R. Rothstein. 2008. "Effects of Occupational Stress Management Intervention Programs: A Meta-analysis." *Journal of Occupational Health Psychology* 13: 69–93.
*Rickard, G., S. Lenthall, M. Dollard, T. Opie, S. Knight, S. Dunn, J. Wakerman, M. MacLeod, J. Seiler, and D. Brewster-Webb. 2012. "Organisational Intervention to Reduce Occupational Stress and Turnover in Hospital Nurses in the Northern Territory, Australia." *Collegian* 19: 211–221.
*Robertson, M. M., Y. H. Huang, M. J. O'Neill, and L. M. Schleifer. 2008. "Flexible Workspace Design and Ergonomics Training: Impacts on the Psychosocial Work Environment, Musculoskeletal Health, and Work Effectiveness among Knowledge Workers." *Applied Ergonomics* 39: 482–494.
Ruotsalainen, J., C. Serra, A. Marine, and J. Verbeek. 2008. "Systematic Review of Interventions for Reducing Occupational Stress in Health Care Workers." *Scandinavian Journal of Work, Environment & Health* 34: 169–178.
Ryff, C. D., and C. L. M. Keyes. 1995. "The Structure of Psychological Well-being Revisited." *Journal of Personality and Social Psychology* 69: 719–727.
Shamseer, L., D. Moher, M. Clarke, D. Ghersi, A. Liberati, M. Petticrew, P. Shekelle, and L. A. Stewart. 2015. "Preferred Reporting Items for Systematic Review and Meta-analysis Protocols (PRISMA-P) 2015: Elaboration and Explanation." *BMJ* 349: g7647.
*Shonin, E., W. Van Gordon, T. Dunn, N. Singh, and M. Griffiths. 2014. "Meditation Awareness Training (MAT) for Work-related Wellbeing and Job Performance: A Randomised Controlled Trial." *International Journal of Mental Health & Addiction* 12: 806–823.
Snape, D., Meads, C., Bagnall, A-M, Tregaskis, O. & Mansfield, L. 2016. *What Works Wellbeing: A Guide to Our Evidence Review Methods*. What Works for Wellbeing Centre. https://whatworkswellbeing.files.wordpress.com/2016/02/what-works-wellbeing-methods-guide-july-2016.pdf
*Sørensen, O. H., and D. Holman. 2014. "A Participative Intervention to Improve Employee Well-being in Knowledge Work Jobs: A Mixed-methods Evaluation Study." *Work & Stress* 28: 67–86.
Stansfeld, S., and B. Candy. 2006. "Psychosocial Work Environment and Mental Health – A Meta-analytic Review." *Scandinavian Journal of Work, Environment & Health* 32: 443–462.
Theorell, T., Hammarström, A., Aronsson, G., Träskman Bendz, L., Grape, T., Hogstedt, C., Marteinsdottir, I., Skoog, I., & Hall, C. (2015). A Systematic Review including Meta-analysis of Work Environment and Depressive Symptoms. *BMC Public Health* 15: doi:10.1186/s12889-015-1954-4.
*Tregaskis, O., K. Daniels, L. Glover, P. Butler, and M. Meyer. 2013. "High Performance Work Practices and Firm Performance: A Longitudinal Case Study." *British Journal of Management* 24: 225–244.
*Uchiyama, A., Y. Odagiri, Y. Ohya, T. Takamiya, S. Inoue, and T. Shimomitsu. 2013. "Effect on Mental Health of a Participatory Intervention to Improve Psychosocial Work Environment: A Cluster Randomized Controlled Trial among Nurses." *Journal of Occupational Health* 55: 173–183.
*Umanodan, R., Y. Kobayashi, M. Nakamura, K. Kitaoka-Higashiguchi, N. Kawakami, and A. Shimazu. 2009. "Effects of a Worksite Stress Management Training Program with Six Short-hour Sessions: A Controlled Trial among Japanese Employees." *Journal of Occupational Health* 51: 294–302.
*Umanodan, R., A. Shimazu, M. Minami, and N. Kawakami. 2014. "Effects of Computer-based Stress Management Training on Psychological Well-being and Work Performance in Japanese Employees: A Cluster Randomized Controlled Trial." *Industrial Health* 52: 480–491.
Van De Voorde, K., J. Paauwe, and M. Van Veldhoven. 2012. "Employee Well-being and the HRM-organizational Performance Relationship: A Review of Quantitative Studies." *International Journal of Management Reviews* 14: 391–407.
Van der Klink, J. J., R. W. Blonk, A. H. Schene, and F. J. Van Dijk. 2001. "The Benefits of Interventions for Work-related Stress." *American Journal of Public Health* 91: 270–276.
Van Horn, J. E., T. W. Taris, W. B. Schaufeli, and P. J. G. Schreurs. 2004. "A Multidimensional Approach to Measuring Teacher Wellbeing." *Journal of Occupational and Organizational Psychology* 77: 365–375.
*Van Wingerden, J., D. Derks, and A. B. Bakker. 2017. "The Impact of Personal Resources and Job Crafting Interventions on Work Engagement and Performance." *Human Resource Management* 56: 51–67.
Warr, P. 1994. "A Conceptual Framework for the Study of Work and Mental Health." *Work & Stress* 8: 84–97.
Warr, P. 2007. *Work, Happiness and Unhappiness*. Mahwah, NJ: Lawrence Erlbaum Associates.

Waterman, A. S. 1993. "Two Conceptions of Happiness: Contrasts of Personal Expressiveness (Eudaimonia) and Hedonic Enjoyment." *Journal of Personality and Social Psychology* 64: 678–691.

Whitman, D. S., D. L. Van Rooy, and C. Viswesvaran. 2010. "Satisfaction, Citizenship Behaviors, and Performance in Work Units: A Meta-analysis of Collective Construct Relations." *Personnel Psychology* 63: 41–81.

Wood, S., M. Van Veldhoven, M. Croon, and L. M. de Menezes. 2012. "Enriched Job Design, High Involvement Management and Organizational Performance: The Mediating Roles of Job Satisfaction and Well-being." *Human Relations* 65: 419–445.

*Yamagishi, M., T. Kobayashi, and Y. Nakamura. 2008. "Effects of Web-based Career Identity Training for Stress Management among Japanese Nurses: A Randomized Control Trial." *Journal of Occupational Health* 50: 191–193.